

Hand number 174

USE OF CHEMICAL WEED CONTROL IN VINEYARDS

REC'D 1959
LIBRARY

Robert G. Hill, Jr., and E. K. Alban
The Ohio Agricultural Experiment Station
Wooster, Ohio

Weed growth beneath the trellis is a serious problem in vineyard management. It interferes with cultural operations and competes with the vines for essential nutrients and moisture. Further, its control by conventional methods, mechanical or hand hoeing, requires considerable labor and cannot be accomplished without the hazard of damage to the grape trunk and roots.

Recently chemical means for controlling this weed growth have been developed. Chemical means of control can be accomplished with less labor and, when properly used, with less damage to the grape vines. Success with this method depends upon use of the proper herbicide and the application of the correct amount of herbicide at the correct time. The use of chemical weed control measures for these under-trellis weeds is recommended for established vineyards and is being practiced by a number of commercial growers. It is suggested, however, that growers using this means of control for the first time familiarize themselves with the techniques of chemical weed control in a small portion of their plantings before making extensive applications.

A number of herbicides have been tested for possible vineyard use. At present only two herbicides can be recommended, DNBP and Diuron. Although DNBP has been widely used, Diuron is at present replacing it in many areas. The use of any other herbicide may damage the vines or leave undesirable residues in the grapes. This mimeograph is designed to serve as a guide to growers wishing to adopt chemical weed control methods in their vineyards.

DNBP - Dinitro ortho secondary butyl phenol (sold commercially as Dow General and Sinox) is an effective herbicide when applied in a diesel fuel oil-water mixture. It is a contact type herbicide which controls weeds by a chemical burning or mowing action. It will destroy any tender vegetative parts of the grape vine which are accidentally contacted. There is little residual action and under conditions favorable to weed growth, three applications will be needed per season. The first application should be made in early spring when the weeds have made their first flush of growth and have reached a height of 6-8 inches. The follow-up sprays should be made at 3-4 week intervals when the weeds have again reached heights of 6-8 inches.

It is recommended that a spray mixture containing 2 pints of 55% DNBP, 10 gallons of diesel fuel oil and enough water to make 100 gallons of spray be used. Where weed growth is dense the amount of herbicide can be increased to 3 pints and the oil to 20 gallons. This material should be applied at the rate of 50 to 100 gallons per acre of sprayed area according to the amount of weed growth.

Diuron - (3-(3,4-dichlorophenyl)-1,1-dimethylurea) is sold commercially as Karmex. It is not a contact type herbicide. To be effective it must be carried, by moisture, into the root zone of the weeds. Because it is relatively insoluble, at recommended rates, it will not penetrate to the grape root zone in sufficient quantities to damage the vines. It breaks down slowly so that a single application will control weed growth for an entire season. For best results it should be applied in very early spring before weed growth has become established and extensive root systems have developed.

This page intentionally blank.

It is recommended that it be used on average soil at the rate of four pounds of the commercial product in 50-100 gallons of water per acre of sprayed area. On lighter soils the rate should be reduced to 3 pounds and on heavier soils the rate can be increased to 6 pounds. Repeat applications during a given season should be avoided and during any season the total amount of herbicide applied should not exceed the recommended rate.

Method of Application - Herbicides in vineyards are best applied under low pressure, 50 pounds. In order to minimize contact with the vines and get best coverage of the weed growth, off-center type nozzles should be used. These nozzles should be mounted 18-22 inches off the ground on either end of a spring loaded boom. Because of the nature of the spray mixtures, they must be kept under agitation. Hydraulic agitation will suffice with small volumes, but mechanical agitation is preferred. Some growers will find the construction of special PTO rigs to be advantageous. Normally a swath 3 feet wide under the trellis should be sprayed. For the most complete coverage and best results this area should be sprayed from both sides.

Applying the Correct Amount - Safe and effective use of herbicides demands the accurate application of the proper amount of the herbicide. In calculating the amount of solution to apply it must be remembered that recommended rates are based upon acre of sprayed area and not acre of crop area. As an example in a vineyard where rows were set 9 feet apart and a 3-foot swath was sprayed, there would be only one acre of sprayed area per 3 acres of vineyard.

If the proper amount of the herbicide and the requisite amount of water is placed in the spray tank and desired pressure maintained, the factors that will influence the rate of application will be the size of the nozzle aperture and the rate of travel. There are a number of ways to adjust these factors. One simple way is as follows:

1. Decide upon the number of gallons of herbicidal spray to be applied per acre of sprayed area and whether it will be applied from both sides of the row, double pass or from one side only, single pass.
2. From table 1 determine the amount of herbicidal mixture required to cover a swath 3 feet wide under a 145 feet of trellis according to the selected plan.

Table 1: Required amounts of herbicidal mixture for a 3-foot wide swath under 145 feet of grape trellis.

No. of Passes	<u>Desired rate/acre sprayed area</u>	
	50 gal	100 gal
Single	2 qt	4 qt
Double	1 qt	2 qt

3. With the sprayer in operation, ascertain, by collecting the solution from one off-center nozzle, the time required to discharge the required volume.
4. Determine over a measured course, in the vineyard, the speed that the spray rig will have to travel to cover 145 feet in the time required to discharge the required volume. Ideally, the rig should travel at about $2\frac{1}{2}$ M.P.H.
5. If the rig must, for proper discharge rate, travel too fast or slow for effective operation, select nozzles of larger or smaller size and repeat steps 3 and 4.
6. When making applications, use selected nozzle and determined speed. It is wise to occasionally recalibrate the equipment.

This page intentionally blank.